

## Assessing Drip Irrigation and Nitrogen Management of Fresh Onions Produced in California Low Desert

**Project Leader: Jairo Diaz**

Desert Research and Extension Center, University of California  
(530) 754-4135, [jdiazr@ucanr.edu](mailto:jdiazr@ucanr.edu)

### **Abstract**

One of the key components for economic success in the crop industry is addressing water and nutrient management. By incorporating current technologies into agricultural production, water and nutrients can be managed to maximize yields, reduce costs, and protect natural resources. Improving irrigation management in vegetable crop production reduces production costs, saves water, and reduces the risk of nutrient export. Agriculture is the largest global consumer of water (around 70 to 90 percent), but there is a lack of scientific data about agricultural water management including scheduling, as well as social, environmental, and economic impacts of irrigation in arid agro-ecosystems, such as Imperial County, CA. Studies show that most farmers do not use scientific methods for scheduling irrigation and nutrient management. Qualitative assessments are used for most farmers to decide when to irrigate and apply fertilizers. The use of technology based on plant needs along with soil moisture indicators can help create a healthy environment for crops. This project will provide critical baseline information of water and nitrogen use in onion production in arid regions using saline irrigation water. Onion growers and crop consultants in the California low desert region will increase their understanding of water conservation and nutrient management and its economic and environmental benefits. Growers and users of irrigation systems will be more aware of new technology (soil, water, and plant diagnostic tools) available for water and fertilizer management.

### **Project Objectives**

1. Evaluate the response of onion to drip irrigation and regimes and compare onion production under different N fertilizer application rates.
2. Communicate findings directly to growers, as well as to crop advisors, academics, regulatory bodies, and agriculture industry.
3. Provide training opportunities to college students.

## Pima Cotton Nitrogen Management, Uptake, Removal – Impacts of Varieties, Subsurface Drip and Furrow Irrigation

**Project Leader: Robert Hutmacher**

University of California, West Side Research and Extension Center  
(559) 884-2411, [rbhutmacher@ucdavis.edu](mailto:rbhutmacher@ucdavis.edu)

### Abstract

Over the past three decades, California cotton production has shifted from nearly all acreage being planted to specialized Upland cotton varieties (the sub-group of high-quality Uplands called “Acala” cotton) to Pima cotton. For the past 10+ years, over 70% of California’s cotton acreage has been planted with Pima cotton varieties, with recent years reaching over 85% of total acreage in Pima. As a premium-quality cotton, Pima commands a significantly higher price than Acala or non-Acala Upland cotton, so Pima is likely the type of cotton most producers will plant in future years. However, it requires a 2-3 week longer growing season than most Acala varieties, and there are known differences in sensitivity to insect pests, impacts of plant water stress on fruiting, and plant responses to management practices such as use of plant growth regulators Kerby et al, 1994; Hutmacher et al, 2004). Silvertooth and Norton (2011), Unruh and Silvertooth (1996) in Arizona and some unpublished CA studies have demonstrated that petiole nitrate guideline recommendations for Pima differ greatly from those developed for Upland cotton. Due to the facts of these known differences in multiple plant characteristics between prevailing Upland versus Pima varieties, we believe separate studies are warranted. More Pima-specific information would assist in efforts to fine-tune nitrogen management practices, avoid negatives associated with inadequate or excess N applications, and provide improved N removal estimates to be used in nitrogen management plans for CA producers.

### Project Objectives

1. Evaluate high-yield potential Pima cotton for impacts of N application amount, variety and irrigation method on total plant N uptake and harvest removal; and
2. Utilize 3 grower farm sites with moderate to high yield potential, using multiple Pima varieties and representing different soil types to determine total above-ground plant N uptake at early open-boll timing, and N removal with harvest (measured as N content of seed, lint, gin trash, measured separately) to better understand Pima N requirements.
3. As information is developed in the study, present information to appropriate grower groups, consultants and industry to give opportunities for feedback and to refine concepts of workable changes in N management approaches.